

## A Report on the Arthropods Collected by the Edinburgh University Galapagos Islands Expedition, 1968<sup>1</sup>

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The Galápagos Archipelago has attracted much scientific study since Charles Darwin's visit in 1835 first drew the attention of the world's biologists to its potential. The initial studies were of collections obtained for description and taxonomic determination of the plants and animals present among the islands. Linsley and Usinger (1966) list 21 expeditions of various sizes and eight individual collectors who worked in the islands for greater or lesser periods of time.

The primary objects of non-taxonomic study have been the vertebrates, notably the birds (Lack, 1947; Bowman, 1961, 1963; and many others), while the terrestrial invertebrates have been comparatively neglected (important exceptions being Curio, 1966, and Linsley, 1966). Even distributional data of invertebrates is fragmentary. Hence, casual collecting by non-specialists can yield valuable information, and new species can even be found in routine sampling of insects around the lights of the Research Station on Santa Cruz.

The authors of this paper worked in the Galápagos Archipelago from July to November 1968. Arthropods were collected whenever time could be spared from principal research projects. The material is consequently highly non-random, being concentrated around the Research Station in Academy Bay with supplementary material from the highlands of Santa Cruz. Additional collections were made on Santiago and Floreana, with only a few specimens being taken on several other islands.

This paper lists, for the interest of students of Galápagos entomology, the material which we collected. Details are given of the islands, locality, habitat zones and date. The number of specimens is also given together with the depository if other than the Royal Scottish Museum, Edinburgh. We are extremely grateful to the authorities who identified the material. Their names are given below, and all identifications and notes or comments in the checklist are initialled for the authority concerned.

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It is interesting to note that Linsley & Usinger (1966) list 618 species of insects from the Galápagos Archipelago reported in the literature prior to 1966. We collected 72 of these, approximately 11.5%. To obtain such a high proportion of the known species in such a short time suggests either that we collected in the same localities as previous workers and duplicated their samples, or that the fauna is very impoverished and many species are widespread. An argument in support of the latter alternative is furnished by the consideration that we amassed 80 species from individual islands, of which no less than 38 are island records new to Linsley & Usinger's list. Our authorities were unable to put names to 8, leaving 30 records of previously known insects on new islands—about 42% of our material. This suggests strongly that the Galápagos insect fauna is limited in number of species, but that many species occur on several islands.

In the systematic list which follows, an asterisk in front of the species name indicates that the species is not listed by Linsley & Usinger (1966). An asterisk in front of the island name signifies that the species is not recorded from that island in the same work. All dates refer to 1968.

### Class ARACHNIDA

#### SCORPIONES: VEJOVIDAE

*Hadruioides lunatus* L. Koch. Santiago: At settlement in James Bay, Arid Zone, 18 August, 1; Waterhole by James Bay, Arid Zone, 18 August, 1; Floreana: base of highest volcano under stone, 1,200 ft. SW side, Transition Zone, 31 August, 1.

#### SCORPIONES: BUTHIDAE

*Centrurus princeps* Karsch. Santa Cruz: East of Research Station, coastal scrub, Arid Zone, 4 August, 1.

#### ARANEAE: ARGIOPIDAE

*Gasteracantha insulana* Thorell. Santa Cruz: East of Research Station, 30 yards from sea, ca 40 ft., Arid Zone, 4 August, 1 female.

All Arachnida determined by D. J. Clark, (NH) 1970, who adds that these species have been recorded from the Galapagos Is. by Banks (1902, *Proc. Wash. Acad. Sci.*, 49–86).

### Class INSECTA

#### DERMAPTERA

*Euboriella annulipes* Lucas. (= *Anisolabis bormansi* Scudder, tests A. Brindle).  
 (\*) Floreana: 2,100 ft., at top of volcano, grassland, short vegetation, Transition Zone, 31 August, 1 nymph. (Det. A.B. 1970).

## DICTYOPTERA: BLATTIDAE

*Periplaneta australasiae* Fabricius. Floreana: 31 August, 1 (Det. D.R.R. 1969).

## DICTYOPTERA: PYCNOSCELIDAE

*Pycnoscelus surinamensis* Linnaeus. (\*) Floreana: base of main volcano, three miles from Black Beach, Arid Zone, 31 August, 1. Santa Cruz: half way along old trail from Puerta Azora-Bella Vista, Transition Zone, 8 September, 2 juvs. (Det. D.R.R. 1969).

## SALTATORIA: TETTIGONIDAE

*Nesoecia cooksoni* Butler. (\*) Santiago: on volcano in James Bay, Arid Zone, 17 August, 1 male (Det. D.R.R. and retained by BM (NH)).

## SALTATORIA: GRYLLIDAE

*Cryptoptilum* sp. (\*) Santiago: on volcano in James Bay, Arid Zone, 17 August, 1 female (Det. D.R.R. 1969).

## MANTODEA: ACRIDIDAE

*Schistocerca melanocera* Stal. (\*) Santiago: in crater of salt mine, James Bay, Arid Zone, 15 August, 1 female & 1 juvenile; at Settlement in James Bay, Arid Zone, 18 August, three males. (Det. V.M.D. 1969).

*Halmenus choristopterus* Snodgrass. Floreana: 30 August, 1 female. (Det. V.M.D. 1969).

*Halmenus robustus* Scudder. Santa Cruz: on vegetation near La Caseta, Humid Zone, 1. (Det. V.M.D. 1969).

## ODONATA: AESCHNIDAE

*Anax amazili* Burmeister. (\*) Santa Cruz: La Caseta, Humid Zone, 15 October, one male. (Det. A.R.W. 1970).

## HEMIPTERA: LYGAEIDAE

*Heraeus pacificus* Barber. Santiago: 11 August, 1 female (Det. G.M.B. 1970).

## NEUROPTERA: HEMEROBIIDAE

*Megalmus darwini* Banks. Santa Cruz: Research Station, Arid Zone, 25 September-14 October, six (Det. A.R.W. 1970).

## NEUROPTERA: CHRYSOPIDAE

*Chrysopa nigripilosa* Banks. (\*) Santa Cruz: Research Station, Arid Zone, 12-27 October, 25. (\*) Santiago: near hut, James Bay, Arid Zone, 14 August, 1; settlement, Arid Zone, 22 September, 1. (Det. A.R.W. 1970).

*Chrysopa* sp. near *galapagoensis* Banks. (\*) Floreana: Wittmer Farm, Humid Zone, 29 August, 1. (\*) Santa Cruz: Research Station, Arid Zone, 22 September, 1. (\*) Santiago: Humid Zone, 23 September, common, 1 specimen taken. (Det. A.R.W. 1970).

## NEUROPTERA: MYRMELEONTIDAE

*Myrmeleon perpilosus* Banks. Santa Cruz: Research Station, Arid Zone, 21 August-28 October, 6 males, 11 females, 2 larvae. (\*) Santa Fe: came to light, 14 September, 1 male. (Det. A.R.W. 1969).

- (\*) *Brachynemurus darwini* Stange. Santiago: James Bay settlement, 21 September, 1 female, 1 larva. (Det. A.R.W. 1969).

LEPIDOPTERA: PIERIDAE<sup>5</sup>

*Phoebis sennae* Linnaeus. San Cristóbal: 600 ft. in Humid Zone below village, 1 August, 5 females. Santa Cruz: half mile west of Research Station, on coast by brackish pool, Arid Zone, 22 August, 2 females. Santiago: James Bay, around flowering shrubs growing between lava blocks, Arid Zone, 14 & 21 August, 9 males & 3 females; James Bay, at settlement, Arid Zone, 21 September, 1 male.

## LEPIDOPTERA: DANAIIDAE

- (\*) *Danaus gilippus* ssp. near *strigosus* Bates. San Cristóbal: near village, 600 ft., Humid Zone, 1 August, 4 males & 4 females.

## LEPIDOPTERA: HESPERIIDAE

*Urbanus dorantes galapagensis* Williams. San Cristóbal: near village, 600 ft., Humid Zone, 1 August, 1 male. Santa Cruz: La Caseta, Humid Zone, 16–18 October, 10 males.

## LEPIDOPTERA: SPHINGIDAE

- Erinnyis ello encantada* Kernbach. Santa Cruz: Research Station, at light, Arid Zone, 4 August, 1 female.  
*Erinnyis obscura conformis* Rothschild & Jordan. Santa Cruz: Research Station, Arid Zone, 19 August–21 October, 2 males & 1 female.  
*Pholus labruscae yupanquii* Kernbach. Santa Cruz: Research Station, Arid Zone, 10 August, 1 male.  
*Celerio lineata florilega* Kernbach. Santa Cruz: Research Station, Arid Zone, 28 October, 1 female.

## LEPIDOPTERA: ARCTIIDAE

- Utetheisa galapagensis* Wallengren. Santa Cruz: Research Station, at light, Arid Zone, 3–5 August, 5 females; 25 September–3 October, 1 male & 6 females; Hornemann Farm, near Bella Vista, 650 ft., Humid Zone, 9 October, 2 females (Det. A.H.H. 1970).  
*Utetheisa ornatrix* Linnaeus. (\*) Santa Cruz: La Caseta, Humid Zone, 15 October, 1 female.

## LEPIDOPTERA: NOCTUIDAE: AGROTINAE

- Agrotis ipsilon* Hufnagel. (\*) Santa Cruz: Research Station, Arid Zone, 27 September, 1 male.  
*Lycophotia oceanica* Schaus. (\*) Santa Cruz: Research Station, at light, Arid Zone, 5 August, 1 female; 21 September–12 October, 1 female & 1 male.

## LEPIDOPTERA: NOCTUIDAE: HADENINAE

- Mythima sequax* Franclemont. Santa Cruz: Hornemann Farm, near Bella Vista, 650 ft., Humid Zone, 9 October, 1 male. (American authors put this in *Pseudaletia* Franclemont).

<sup>5</sup>All Lepidoptera determined by E. C. Pelham-Clinton unless otherwise stated.

## LEPIDOPTERA: NOCTUIDAE: AMPHIPYRINAE

- Magusa* sp. (\*) Santa Cruz: Research Station, Arid Zone, 21 August, 1 male; 4 October, 2 males. (Teste A.H.H. 1970, the *Magusa* of Galápagos is not *M. orbifera* (Walker), but is undescribed).
- Platysenta apameoides* Guenée (= *ebba* Schaus). (\*) Santa Cruz: Research Station, Arid Zone, 6 October, 1 female; Hornemann Farm, near Bella Vista, 650 ft., Humid Zone, 9 October, 1 female. (Teste A.H.H. 1970, the species formerly known as *P. apameoides* and so listed by Linsley & Usinger (1966) is *P. plagiata* (Walker)).
- Harrisonia williamsi* Schaus. Santa Cruz: Research Station, Arid Zone, 22 August–14 October, 6 females.
- Amyna insularum* Schaus. Santa Cruz: Research Station, Arid Zone, 26 September–4 October, 1 male & 2 females.
- Elaphria dubiosa* Schaus. Santa Cruz: Research Station, Arid Zone, 4–21 October, 4 females & 1 male, (described by Schaus as a *Rivula* and so listed by Linsley & Usinger (1966), in Catocalinae–A.H.H., 1970).

## LEPIDOPTERA: NOCTUIDAE: CATOCALINAE—INCLUDING OPHIDERINAE

- Melipotis harrisoni* Schaus. Santa Cruz: Research Station, Arid Zone, 5 August–12 October, 2 females & 1 male.
- (\*) *Lyncestis* sp. near *acantioides* (Guenée). Santa Cruz: Research Station, Arid Zone, 12–13 October, 1 male & 1 female (Teste A.H.H. 1970, the species near *acantioides* should be separated from *Melipotis*).
- Epidromia zephyritis* Schaus. This species occurs in two forms in both sexes; the forms appear to be inseparable by genitalia. Typical (dark) form—Santa Cruz: Research Station, at light, Arid Zone, 5 August, 2 females; 13 October, 1 female. Light form—Santa Cruz: Research Station, at light, Arid Zone, 25 September–12 October, 3 males & 1 female.
- Psorya hadesia* Schaus. (\*) Santa Cruz: Research Station, at light, Arid Zone, 3 August, 1 female; 3–4 October, 1 male & 1 female.
- Mocis incurvalis* Schaus. Santa Cruz: Research Station, Arid Zone, 4 October, 1 female.
- (\*) *Glympis* sp. Santa Cruz: Research Station, Arid Zone, 25 September–14 October, 3 males & 2 females. (Det. A.H.H. 1970).

## LEPIDOPTERA: GEOMETRIDAE

- (\*) *Eupithecia leleupi* Herbulot. Santa Cruz: Research Station, Arid Zone, 12 October, 1 female. (Det. D.S.F. 1970).
- Camptogramma stellata* Guenée. Santa Cruz: Research Station, at light, Arid Zone, 3 August–6 October, 12 females.
- Cosymbia impudens* Warren. Santa Cruz: Research Station, at light, Arid Zone, 3 August–4 October, 2 males & 1 female. Santiago: Settlement, Arid Zone, 23 September, 3 females.
- (\*) *Semiothisa cruciata* Herbulot. Santa Cruz: Research Station, Arid Zone, 26 September, 2 females (1 without abdomen). (Det. D.S.F. 1970).

## LEPIDOPTERA: PYRALIDAE

- (\*) *Hymenia perspectalis* Hubner. Santa Cruz: Hornemann Farm, 650 ft., near Bella Vista, Humid Zone, 8 October, 1 female.

(\*) *Stemorrhages* sp. near *lustralis* (Guenée). Santa Cruz: Research Station, Arid Zone, 12 October, 1 male. (Det. M. Shaffer 1970).

*Pileocera bufalis* Guenée. Santa Cruz: Research Station, 3 October, 1 male.

*Beebea guglielmi* Schaus. (\*) Santa Cruz: Research Station, at light, Arid Zone, 4 August, 1 female.

## LEPIDOPTERA: TORTRICIDAE

*Crociosema plebeiana* Zeller. (\*) Santa Cruz: Research Station, Arid Zone, 3 October, 1 female (without head).

## LEPIDOPTERA: GELECHIIDAE

*Aristotelia naxia* Meyrick. (\*) Santa Cruz: Research Station, Arid Zone, 3 October, 1 male.

## LEPIDOPTERA: BLASTOBASIDAE

*Blastobasis crotospila* Meyrick. (\*) Santa Cruz: Research Station, Arid Zone, 26 September, 1 female.

## LEPIDOPTERA: HYPONOMEUTIDAE

*Atteva hysginiella* Wallengren. Santiago: James Bay, near hut, Arid Zone, 14 August, 1 female.

## COLEOPTERA: CARABIDAE

*Selenophorus galapagoensis* G.R. Waterhouse. (\*) Pinta: Arid Zone, 22 September. (Det. P.M.H.).

## COLEOPTERA: OEDOMERIDAE

*Alloxaxis collenettei* Blair. Santa Cruz: Research Station, 14 October, 2 (Det. by C.M.F. von H. as *Oxaxis collenettei*).

## COLEOPTERA: ELATERIDAE

*Physorinus quirsfeldi* Mutchler. Santa Cruz: Research Station, Arid Zone, 12–14 October, 2. (Det. C.M.F. von H. 1970).

## COLEOPTERA: COCCINELLIDAE

*Cycloneda sanguinea* Linnaeus. Santa Cruz: On *Mora* vegetation, about 1.5 miles west of La Caseta in the tortoise reserve, Wet Zone, 2; Research Station, Arid Zone, 9 August, 1. (Det. R.P.D. 1970).

## COLEOPTERA: RHIPIPHORIDAE

(\*) Genus and species unknown at the British Museum (Natural History). Santa Cruz: Research Station, Arid Zone, 28 August, 1; 13–14 October, 2.

## COLEOPTERA: TENEBRIONIDAE

*Stomion galapagoensis* G.R. Waterhouse. Floreana: 2.5 miles east from Black Beach along track, 1100 ft., Arid Zone, 3; On top of volcano, 2,100 ft., in grass and short vegetation, 31 August, 4; 3 miles east of Black Beach, at foot of final cone of volcano, 1,500 ft., Arid Zone, 31 August, 2. (Det. M.J.D.B. 1970).

*Stomion laevigatum* G.R. Waterhouse. Santiago: On top of volcano in James Bay, Arid Zone, 11 August, 1. (Det. M.J.D.B. 1970).

*Stomion rugosum* Van Dyke. Pinta: Arid Zone, 22 September, 1. (Det. M.J.D.B. 1970).

*Ammophorus bifoveatus* G.R. Waterhouse. (\*) Santiago: On top of volcano in James Bay, Arid Zone, 11 August, 3. (Det. M.J.D.B. 1970).

*Pedonoeces bauri* Linell. (\*) Floreana: 3 miles east of Black Beach, at foot of final cone of volcano, 1,200 ft., Arid Zone, 31 August, 1. (Det. M.J.D.B. 1970).

*Pedonoeces opacus* Van Dyke. (\*) Santa Cruz: 1 mile east from Research Station, 150 yards from coast, Arid Zone, 4 August, 1 (Det. M.J.D.B. 1970).

COLEOPTERA: BOSTRICHIDAE

*Amphicerus cornutus galapaganus* Lesne. Santa Cruz: Research Station, Arid Zone, 23 October, 1 (Det. C.M.F. von H. 1970).

COLEOPTERA: CERAMBYCIDAE

*Eburia lanigera* Linell. (\*) Santa Cruz: Research Station, Arid Zone, 12-13 October, 2. (Det. R.T.T. 1970).

*Estoloides galapagoensis* Blair. Santa Cruz: Research Station, Arid Zone, 13-14 October. (Det. R.T.T. 1970).

*Acanthoderes galapagoensis* Linell. Santa Cruz: Research Station, Arid Zone, 13 October, 1. (Det. R.T.T. 1970).

COLEOPTERA: CURCULIONIDAE

*Pantomerus galapagoensis* Linell. (\*) Floreana: 3 miles east of Black Beach, in dry scrub, 1,500 ft., Arid Zone, 31 August, 1. (Det. R.T.T. 1970).

DIPTERA: TIPULIDAE

*Limonia (Geranomyia) tibialis* Loew. Santa Cruz: Media Luna, in grassland, Wet Zone, 18 October, 1 female. (Det. A.M.H. 1970); Research Station, at night, Arid Zone, 20 August, 1 male. (Det. A.R.W. 1970).

DIPTERA: CULICIDAE

*Aedes (Ochlerotatus) taeniorhynchus* Wiedemann. Santa Cruz: Research Station, found dead on lab. bench in morning, Arid Zone, 5 August, 1 female. (Det. A.H.H. 1970).

DIPTERA: TABANIDAE

*Tabanus vittiger* Thomson. Santa Cruz: Research Station, Arid Zone, 2 September, 1 female. (Det. H.O. 1970).

DIPTERA: CALLIPHORIDAE

*Sarcophaga* sp. Santa Cruz: Research Station, 2 August, 1 male.

HYMENOPTERA: APIDAE

*Xylocopa darwini* Cockerell. Santa Cruz: found near brackish pool, 0.5 mile west of Research Station, Arid Zone, 22 August, 1 female. (Det. A.R.W. 1970).

HYMENOPTERA: MUTILLIDAE

*Photopsis* sp. (\*) Santiago: settlement, Arid Zone, 23 September, 1 male. (Det. M.C.D. 1970).

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The authorities who performed the identifications are: G. M. Black (Hemiptera), M. J. D. Brendell (Coleoptera), A. Brindle (Dermaptera), D. J. Clark (Arachnida), M. C. Day (Hymenoptera), V. M. Dirsch (Mantodea), D. S. Fletcher (Lepidoptera), P. M. Hammond (Coleoptera), C. M. F. von Hayek (Coleoptera), A. H. Hayes (Lepidoptera), A. M. Hutson (Diptera), H. Oldroyd (Diptera), E. C. Pelham-Clinton (Lepidoptera), R. D. Pope (Coleoptera), D. R. Ragge (Orthoptera), R. T. Thomson (Coleoptera), A. R. Waterson (Odonata, Neuroptera, Hymenoptera and Diptera).

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